

--Cross Reference to Related Applications

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This application is a continuation of application serial no. 09/106,415, filed on June 29, 1998, now U.S. Patent no. 6,309,400, and is further ~~This application is~~ related to the following co-pending patent applications: Application Serial No. 09/106,686; Application Serial No. 09/106,028; and Application Serial No. 09/106,661, all of which are hereby incorporated herein by reference.--

In the Claims:

This listing of claims will replace all prior versions in the application:

Status of Claims

Claims 1-20 (previously canceled)

Please amend claims 21, 23, 28 and 30 as follows:

1 ~~21~~ **(currently amended)** A curved ultrasonic surgical end effector comprising:

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a concave treatment segment defining a first length comprising first and second side walls and a central ridge contiguous with the first length; and
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wherein the treatment segment is symmetrical about a plane bisecting the central ridge.

2 ~~22~~ **(previously added)** The curved ultrasonic surgical end effector according to Claim ~~21~~, wherein the ultrasonic end effector further comprises a convex bottom surface.

4 ~~23~~ **(currently amended)** A balanced ultrasonic surgical instrument comprising:

an ultrasonic transmission rod having a proximal end and a distal end; and
a balance region including first and second balance asymmetries wherein the balance region extends from a node point at the distal end of the ultrasonic transmission rod to a proximal end of a curved ultrasonic surgical end effector, wherein the curved ultrasonic surgical end effector further comprises a concave top

abc2 surface defining a first length including a central ridge contiguous with the first length. E2

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24.(previously added) The balanced ultrasonic surgical instrument according to Claim ~~23~~²⁴, wherein the first and second balance asymmetries are positioned to counter torque created in the proximal end of the end effector by the curved ultrasonic surgical end effector.

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25.(previously added) The balanced ultrasonic surgical instrument according to Claim ~~24~~²⁵, wherein the first and second balance asymmetries are positioned such that transverse vibrations in the ultrasonic transmission rod are substantially equal to zero.

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26.(previously added) The balanced ultrasonic surgical instrument according to Claim ~~24~~²⁵ wherein the balance ratio of the transmission waveguide is less than 1:10.

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27.(previously added) The balanced ultrasonic surgical instrument according to Claim ~~26~~²⁷ wherein the balance ratio of the transmission waveguide is less than 1:200.
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28.(currently amended) The balanced ultrasonic surgical instrument according to Claim ~~28~~²⁹ wherein the curved end effector and the balance region are bisected by a plane of symmetry, the curved end effector being substantially symmetrical on either side of the plane of symmetry, the first balance asymmetry comprising a flat surface in the balance region wherein the first flat surface is substantially perpendicular to the plane of symmetry and the second balance asymmetry comprises a second flat surface in the balance region opposite the first flat surface wherein the second flat surface is substantially perpendicular to the ~~second~~ plane of symmetry.

10 29.(previously added) The balanced ultrasonic surgical instrument according to Claim 28⁹ wherein the first balance asymmetry is shorter than the second balance asymmetry.

14 30.(currently amended) A curved ultrasonic surgical end effector, wherein the curved ultrasonic end effector comprises:

a treatment region defining a first length and having a concave-shaped segment, the concave-shaped segment comprising first and second side walls and a central ridge contiguous with the first length; and

wherein the concave-shaped segment is symmetrical about a plane bisecting the central ridge.

3 31.(previously added) The curved ultrasonic surgical end effector according to Claim 2², wherein the convex bottom surface is wider than the central ridge.

B2 32.(previously added) The curved ultrasonic surgical end effector according to Claim 23⁴, wherein the ultrasonic end effector further comprises a convex bottom surface.

12 33.(previously added) The curved ultrasonic surgical end effector according to Claim 32¹¹, wherein the convex bottom surface is wider than the central ridge.

13 34.(previously added) The balanced ultrasonic surgical instrument according to Claim 23⁴, wherein the first and second balance asymmetries are symmetrical about a plane bisecting the central ridge.